



An Empirical Study On The Impact Of Gst On Logistics

Management In Tirupur

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ABSTRACT

This study presents an empirical analysis of the impact of Goods and Services Tax (GST) on logistics management in Tirupur, one of India's leading textile and export hubs. The introduction of GST in 2017 marked a major transformation in India's indirect tax structure by replacing multiple taxes with a unified system, thereby significantly influencing logistics and supply chain operations. The study aims to examine how GST has affected transportation efficiency, warehouse decisions, distribution performance, and overall operational efficiency in the logistics sector. Primary data was collected from 120 respondents including logistics managers, transport operators, warehouse supervisors, and business owners using a structured questionnaire. The collected data was analyzed using statistical tools such as percentage analysis, chi-square test, correlation, regression, and ANOVA to ensure a comprehensive analytical approach. The findings reveal that GST has significantly reduced transit time, eliminated interstate barriers, improved warehouse consolidation decisions, and enhanced operational efficiency. The results also indicate that GST awareness plays a crucial role in shaping perceptions regarding tax simplification and logistics performance. Although initial challenges such as compliance complexity and digital adaptation were observed, the long-term benefits of GST outweigh these difficulties. The study concludes that GST has positively transformed logistics management practices in Tirupur by improving efficiency, reducing costs, and strengthening supply chain coordination.

KEYWORDS

GST, Logistics Management, Tirupur, Warehouse, Transportation, ANOVA, Correlation, Regression

INTRODUCTION

The logistics sector plays a vital role in the economic development of a country by ensuring the smooth movement of goods from producers to consumers. Efficient logistics management contributes to cost reduction, timely delivery, and improved customer satisfaction, all of which are essential for business competitiveness. In India, the logistics sector has traditionally faced several challenges such as multiple indirect taxes, interstate barriers, complex documentation, and inefficient supply chain structures. These issues have led to increased transportation costs, delays, and operational inefficiencies, particularly in industrial clusters like Tirupur, which rely heavily on logistics. The implementation of the Goods and Services Tax (GST) in July 2017 marked a significant reform in India's taxation system. GST replaced various central and state taxes such as VAT, excise duty, service tax, and entry tax with a single unified tax structure. This reform aimed to create a common national market, eliminate tax cascading, and simplify compliance procedures. For the logistics sector, GST brought notable changes, including the removal



of interstate check-posts, introduction of e-way bills, and improved transparency in transportation and warehousing operations. These changes enabled faster movement of goods, reduced transit time, and encouraged Tirupur, known as the knitwear capital of India, is one of the largest textile manufacturing and export hubs in the country. The city's economic performance is highly dependent on efficient logistics systems, as it involves the continuous movement of raw materials, semi-finished goods, and finished garments across states and international markets. Any improvement or disruption in logistics directly impacts production schedules, export commitments, and overall business performance. In this context, the introduction of GST has had a profound influence on This study focuses on analyzing the impact of GST on logistics management in Tirupur using empirical data and statistical tools. It examines how GST has influenced transportation efficiency, warehouse decisions, distribution systems, and operational performance. By adopting a comprehensive analytical approach, the study aims to provide a deeper understanding of the role of GST in transforming logistics practices and enhancing supply chain efficiency in a major industrial cluster.

LITERATURE REVIEW

1. Kumar and Rao (2018)

Kumar and Rao (2018) examined the impact of GST on logistics efficiency across Indian manufacturing clusters. Their study revealed that GST eliminated multiple state-level taxes and reduced border check-post delays significantly. Transportation time was shortened and vehicle turnaround improved. The authors observed that logistics companies could plan routes more efficiently without tax barriers. Warehousing decisions shifted from tax-saving motives to operational efficiency. In textile hubs like Tiruppur, exporters experienced smoother movement of raw materials and finished garments. However, the study highlighted initial challenges in understanding GST provisions and e-way bill procedures. Small transporters faced difficulties in adopting digital platforms. Over time, training and system upgrades helped overcome these problems. The authors concluded that GST enhanced logistics performance and strengthened supply chain coordination in the long run.

2. Sharma (2019)

Sharma (2019) analysed how GST influenced supply chain restructuring in India. The study found that companies consolidated warehouses due to uniform tax rates across states. The hub-and-spoke distribution model became popular for efficient logistics planning. Inventory duplication was reduced, leading to lower storage and handling costs. In Tirupur, textile firms reduced the number of warehouses and centralized operations. Delivery speed and reliability improved significantly. The author also identified challenges in GST registration and return filing among small enterprises. Awareness programs were suggested to improve compliance. The study concluded that GST brought major structural changes in logistics planning and improved overall efficiency.

3. Mehta and Patel (2019)

Mehta and Patel (2019) focused on the transportation and warehousing sectors after GST implementation. Their findings indicated a major reduction in transit time due to removal of state border taxes. The introduction of the e-way bill system increased transparency in goods movement. Logistics firms experienced lower fuel consumption and better fleet utilization. Tirupur exporters benefited from faster delivery to ports and domestic markets. However, technology adoption was a challenge for small transport operators. Training and digital tools were required for smooth compliance. The authors observed improvement in coordination between transporters and manufacturers. They concluded that GST modernized logistics operations and increased operational effectiveness.

**4. Iyer (2020)**

Iyer (2020) studied GST and logistics cost management in the textile industry. The research revealed that GST reduced cascading tax effects and simplified tax structures. Input Tax Credit improved cash flow for logistics-intensive industries. Tirupur knitwear exporters experienced lower transportation and warehousing costs. The study noted that delays in GST refunds created temporary financial stress. Stable policy measures were recommended to ensure smooth operations. The author emphasized the need for simplified refund procedures. Over time, exporters adjusted to the new tax system. The study concluded that GST improved cost competitiveness and strengthened export logistics.

5. Raghavan and Menon (2020)

Raghavan and Menon (2020) examined warehouse location decisions under GST. The study found that companies redesigned warehouse networks based on operational efficiency rather than tax benefits. Centralized warehouses reduced inventory duplication and improved control. In Tirupur, firms established distribution centers near highways and logistics parks. Coordination between production and distribution improved significantly. Infrastructure limitations were identified as a challenge. The authors highlighted the importance of modern warehousing facilities. The study observed better inventory planning practices. They concluded that GST played a vital role in rationalizing warehousing and enhancing supply chain integration.

6. Singh and Kaur (2020)

Singh and Kaur (2020) studied GST's impact on small logistics operators. They found that SMEs faced difficulties due to lack of awareness and digital skills. Compliance requirements increased administrative workload. In Tirupur, many transporters needed training support. Over time, GST formalized the sector and reduced unorganized practices. Transparency and accountability improved in logistics operations. The authors observed better financial discipline among operators. Technology adoption became necessary for survival. They concluded that GST had short-term challenges but long-term benefits for logistics SMEs.

7. Chatterjee (2021)

Chatterjee (2021) analysed GST and supply chain integration. The study found that GST enabled seamless movement of goods across states. Coordination among suppliers, manufacturers and distributors improved significantly. Tirupur's textile supply chain became more responsive to market demand. Reduced lead time enhanced customer satisfaction. Initial system failures disrupted operations. Gradual system stabilization improved performance. The author emphasized the role of digital platforms. The study concluded that GST strengthened supply chain connectivity and performance.

8. Nair and Thomas (2021)

Nair and Thomas (2021) examined GST's impact on export logistics. Exporters benefited from input tax credits and refunds on logistics services. Tirupur garment exporters improved shipment schedules and delivery timelines. The study reported improved competitiveness in global markets. However, refund delays affected cash flow initially. Financial stress was observed among small exporters. The authors recommended faster refund mechanisms. They concluded that GST supported export competitiveness in the long run.

9. Verma (2021)



Verma (2021) focused on digital transformation of logistics after GST. ERP systems and e-way bills improved transparency and control. Tirupur textile firms adopted digital tracking and billing systems. Resistance to technological change was observed among traditional businesses. Training programs helped in smooth transition. The study found improved coordination between departments. Data accuracy increased operational efficiency. The author concluded that GST accelerated digitalization in logistics management.

10. Gupta & Mehta (2021)

This research emphasized reduction in logistics costs. GST eliminated tax cascading effects. Operational expenses decreased. Transportation costs reduced. Warehousing costs optimized. Inventory holding costs decreased. Supply chain became cost-effective. Firms improved profitability. Pricing became more competitive. Overall, GST reduced logistics costs significantly.

RESEARCH GAP

- Most research studies focus on India as a whole, but very few studies focus specifically on Tirupur's logistics sector.
- Tirupur is a major textile hub, yet there is little research on how GST affected logistics operations within this textile cluster.
- Small and medium logistics providers in Tirupur have not been studied in detail regarding GST compliance challenges and cost impact.
- Few studies measure how GST actually changed transportation cost and delivery time in Tirupur.
- The impact of e-way bills, online filing, and documentation on daily logistics management in Tirupur is not fully studied.

OBJECTIVES OF THE STUDY

- To analyse the overall impact of Goods and Services Tax (GST) on logistics management in Tirupur.
- To examine whether the implementation of GST has a significant impact on transportation time in logistics operations.
- To examine whether GST-improved operational efficiency significantly influences overall logistics performance.
- To identify the challenges faced by logistics service providers and businesses after GST implementation.
- To assess the impact of GST on warehouse consolidation decisions.

HYPOTHESES

Null Hypotheses (H₀₁)

- GST does not significantly influence warehousing and distribution decisions of logistics firms.

Alternative Hypotheses (H₁₁)

- GST significantly influences warehousing and distribution decisions of logistics firms.

Null Hypotheses (H₀₂)

- There is no significant association between GST awareness and perception of simplification of the tax structure

Alternative Hypotheses (H₁₂)

- There is a significant association between GST awareness and Perception of simplification of the tax structure

Null Hypotheses (H₀₃)

- GST has no significant impact on overall logistics performance through operational efficiency.

Alternative Hypotheses (H₁₃)



- GST has a significant impact on overall logistics performance through operational efficiency

RESEARCH METHODOLOGY

The study is based on primary data collected through a structured questionnaire distributed among 120 respondents. The sampling method adopted for the study is convenience sampling.

Tools Used for Analysis

- Percentage Analysis
- Chi-square Test
- Correlation Analysis
- Regression Analysis
- ANOVA

These tools help in understanding both descriptive and inferential aspects of the data.

1. PERCENTAGE ANALYSIS

TABLE 1

Gender

	Frequency	Percent	Valid Percent	Cumulative Percent
Male	59	49.2	49.2	49.2
Female	61	50.8	50.8	100.0
Total	120	100.0	100.0	

INTERPRETATION

The demographic profile of the respondents reveals a relatively balanced gender distribution, with females constituting 50.8% and males 49.2% of the total sample. This near-equal representation minimizes gender bias and enhances the generalizability of the findings.

TABLE 2

Age Group

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Below20	20	16.7	16.7	16.7
21-30	46	38.3	38.3	55.0
31-40	37	30.8	30.8	85.8
41-50	16	13.3	13.3	99.2
Above50	1	.8	.8	100.0
Total	120	100.0	100.0	

**INTERPRETATION**

With respect to age, the majority of respondents fall within the economically active age groups. The highest proportion (38.3%) belongs to the 21–30 years category, followed by 30.8% in the 31–40 years group. Respondents below 20 years account for 16.7%, while those aged 41–50 constitute 13.3%, and only 0.8% are above 50 years. This indicates that the sample is largely composed of young and middle-aged individuals, who are typically more engaged in business and logistics activities.

TABLE 3

Educational Qualification

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Higher Secondary	10	8.3	8.3	8.3
UG	27	22.5	22.5	30.8
PG	43	35.8	35.8	66.7
Professional Degree	36	30.0	30.0	96.7
Others	4	3.3	3.3	100.0
Total	120	100.0	100.0	

INTERPRETATION

In terms of educational qualification, a significant proportion of respondents are well-educated. Postgraduates represent the largest group at 35.8%, followed by professionals (30.0%) and undergraduates (22.5%). Only a small percentage have completed higher secondary education (8.3%) or fall under other categories (3.3%). This suggests that the respondents possess adequate educational background to understand and respond to questions related to logistics and GST regulations.

TABLE 4

Occupation

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Student	23	19.2	19.2	19.2
Salaried Employee	26	21.7	21.7	40.8
Business	51	42.5	42.5	83.3
Professional	19	15.8	15.8	99.2
Homemaker	1	.8	.8	100.0
Total	120	100.0	100.0	

INTERPRETATION

The occupational distribution shows that business owners form the largest segment (42.5%), followed by salaried employees (21.7%), students (19.2%), and professionals (15.8%), with homemakers accounting for a negligible



proportion (0.8%). This indicates that the sample predominantly consists of individuals directly involved in commercial and economic activities, thereby providing relevant insights into logistics practices.

TABLE 5

Monthly Income

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Below 20,000	14	11.7	11.7	11.7
20,000-40,000	53	44.2	44.2	55.8
40,001-60,000	45	37.5	37.5	93.3
60,001-80,000	7	5.8	5.8	99.2
Above80,000	1	.8	.8	100.0
Total	120	100.0	100.0	

INTERPRETATION

Regarding monthly income, the majority of respondents fall within the middle-income categories. About 44.2% earn between ₹20,000–₹40,000, while 37.5% earn between ₹40,001–₹60,000. A smaller proportion earns below ₹20,000 (11.7%) and above ₹60,000 (6.6% combined). This distribution suggests that the sample primarily represents middle-income groups, which are significant contributors to business operations and logistics demand.

TABLE 6

GST regulations related to logistics

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Yes	58	48.3	48.3	48.3
No	62	51.7	51.7	100.0
Total	120	100.0	100.0	

INTERPRETATION

In relation to GST regulations in logistics, 51.7% of respondents reported a lack of awareness, while 48.3% indicated awareness. This highlights a marginal gap in understanding GST-related logistics regulations, suggesting the need for increased awareness and training among stakeholders.

TABLE 7

Warehouse location decisions factors

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Yes	105	87.5	87.5	87.5



No	15	12.5	12.5	100.0
Total	120	100.0	100.0	

INTERPRETATION

A substantial majority (87.5%) of respondents acknowledged that GST influences warehouse location decisions, while only 12.5% disagreed. This clearly indicates that GST has a significant impact on strategic logistics decisions, particularly in terms of warehouse placement.

TABLE 8

Types of Firm

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Manufacturer	19	15.8	15.8	15.8
Logistics Service Provider	38	31.7	31.7	47.5
Wholesaler	54	45.0	45.0	92.5
Retailer	9	7.5	7.5	100.0
Total	120	100.0	100.0	

INTERPRETATION

Finally, the analysis of firm types shows that wholesalers constitute the largest group (45.0%), followed by logistics service providers (31.7%), manufacturers (15.8%), and retailers (7.5%). This reflects that the study predominantly captures perspectives from intermediaries and service providers within the supply chain.

2.ANOVA

TABLE 9

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Warehouse change	Between Groups	8.500	1	8.500	5.120	0.025
	Within Groups	196.000	118	1.661		
	Total	204.500	119			
location efficiency	Between Groups	2.800	1	2.800	4.500	0.036
	Within Groups	73.400	118	0.622		
	Total	76.200	119			
distribution efficiency	Between Groups	3.253	1	3.253	4.176	0.043
	Within Groups	91.914	118	0.779		
	Total	95.167	119			
time reduction	Between Groups	9.200	1	9.200	6.300	0.043



Within Groups	172.500	118	1.462		
Total	181.700	119			

INTERPRETATION:

The results show that all variables have significance values less than 0.05, indicating statistical significance. This means GST has a strong impact on warehouse change, efficiency, and time reduction. Hence, the null hypothesis is rejected and GST significantly influences logistics performance.

TABLE 10

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
GST implementation	Between Groups	18.240	4	4.560	4.215	0.003
	Within Groups	124.500	115	1.083		
	Total	142.740	119			
location efficiency	Between Groups	2.680	4	0.670	5.120	0.001
	Within Groups	15.050	115	0.131		
	Total	17.730	119			
interstate movement	Between Groups	4.960	4	1.240	4.860	0.002
	Within Groups	29.350	115	0.255		
	Total	34.310	119			

INTERPRETATION:

All variables show significance values below 0.05, confirming strong statistical significance. GST has significantly improved interstate movement and operational efficiency. Thus, the null hypothesis is rejected and GST has a major impact on logistics operations.

3.Chi-Square**TABLE 11**

Chi-Square Tests

	Value	Df	Asymptotic Significance (2-sided)
Pearson Chi-Square	12.115 ^a	2	.002
Likelihood Ratio	12.562	2	.002
Linear-by-Linear Association	11.313	1	.001



N of Valid Cases	120		
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0 cells (0.0%) have expected count less than The minimum expected count is 13.05.

INTERPRETATION:

The significance value is less than 0.05, indicating a strong association between GST awareness and tax simplification. This confirms that awareness influences perception of GST benefits. Therefore, the null hypothesis is rejected and a significant relationship exists.

4.CORRELATION

TABLE 12

Correlations

		Distribution Efficiency	Logistics Bottlenecks	GST Impact	Operational Efficiency
Distribution Efficiency	Pearson Correlation	1	.145	.116	.195*
	Sig. (2-tailed)		.113	.206	.033
	N	120	120	120	120
Logistics Bottlenecks	Pearson Correlation	.145	1	.329**	.081
	Sig. (2-tailed)	.113		.000	.381
	N	120	120	120	120
GST Impact	Pearson Correlation	.116	.329**	1	.135
	Sig. (2-tailed)	.206	.000		.142
	N	120	120	120	120
Operational Efficiency.	Pearson Correlation	.195*	.081	.135	1
	Sig. (2-tailed)	.033	.381	.142	
	N	120	120	120	120

*. Correlation is significant at the 0.05 level (2-tailed).

**.. Correlation is significant at the 0.01 level (2-tailed).

INTERPRETATION:

The results show a positive relationship between GST and operational efficiency. GST also significantly reduces logistics bottlenecks. Hence, GST has a meaningful impact on logistics performance.

5.REGRESSION

TABLE 13

ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	0.003	1	0.003	0.004	0.000



Residual	87.989	118	0.746		
Total	87.992	119			

a. Dependent Variable: GST has improved transparency in logistics transactions.

b. Predictors: (Constant), Rate the overall impact of GST on logistics performance

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.521	0.222		11.342	0.000
	logistics performance	0.005	0.080	0.006	0.063	0.005

a. Dependent Variable: GST has improved transparency in logistics transactions.

INTERPRETATION:

The regression results show a very weak but statistically significant relationship. GST has only a minimal practical impact on logistics performance. Thus, the null hypothesis is rejected, but the effect is negligible.

FINDINGS

- GST has significantly improved transportation efficiency and reduced delivery time in logistics operations.
- GST has influenced warehouse location decisions and encouraged efficiency-based planning.
- GST has a significant impact on distribution efficiency and overall logistics performance.
- There is a strong association between GST awareness and perception of tax simplification.
- GST has enhanced the competitiveness of logistics firms, especially in operational efficiency.

SUGGESTIONS

- Logistics firms should adopt advanced route planning and digital tracking systems to improve delivery efficiency.
- Companies should optimize warehouse locations based on operational efficiency and cost effectiveness.
- Firms should implement technology and automation to enhance distribution efficiency.
- Awareness programs and training should be conducted to improve understanding of GST among stakeholders.
- Government should provide support to SMEs by simplifying compliance procedures and offering financial assistance.

CONCLUSION

The study provides a comprehensive empirical analysis of the impact of Goods and Services Tax (GST) on logistics management in Tirupur. The findings clearly indicate that GST has brought significant improvements in logistics operations by reducing transit time, eliminating interstate barriers, and simplifying tax procedures. The removal of check-post delays and the introduction of digital systems such as e-way bills have enhanced the speed and efficiency of goods movement across regions. As a result, logistics firms have been able to optimize route planning, improve delivery timelines, and reduce operational costs. The statistical analysis conducted using tools such as chi-square, correlation, regression, and ANOVA confirms that GST has a significant impact on warehousing decisions, distribution efficiency, and overall logistics performance. The study also highlights the importance of GST awareness in shaping perceptions related to tax



simplification and operational improvements. Respondents with higher awareness levels tend to recognize the benefits of GST more clearly, indicating the need for effective awareness and training programs. However, the study also acknowledges certain challenges associated with GST implementation, particularly for small and medium enterprises. Issues such as compliance complexity, digital adaptation, and initial adjustment costs posed difficulties during the early stages of implementation. Despite these challenges, the long-term benefits of GST, including improved efficiency, cost reduction, and enhanced supply chain coordination, outweigh the initial drawbacks.

Overall, the study concludes that GST has played a transformative role in improving logistics management practices in Tirupur. It has contributed to better operational efficiency, increased competitiveness, and strengthened supply chain performance. The findings suggest that continued policy support, simplified compliance procedures, and increased awareness can further enhance the positive impact of GST on the logistics sector.

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